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Balancing size exclusion and adsorption of polymers in nanopores WON KIM, CHANG Y. RYU, Rensselaer Polytechnic Institute, Department of Chemistry and Chemical Biology — The liquid chromatography at critical condition (LCCC) presents the condition, at which the size exclusion and adsorption of polymer chains are balanced upon interactions with nanoporous substrates. In this study, we investigate how the polymer interactions with nanopores are affected by the solvent quality and nanopore size. Specifically, we measure the retention times of monodisperse polystyrenes in C18-bonded nanoporous silica column as a function of molecular weight, when a mixed solvent of methylene chloride and acetonitrile are used as elutent. C18-bonded silica particles with 70, 100, and 250 A pore size are used as a stationary phase to study how the transition from SEC-like to IC-like retention behavior depends on the condition of temperature and solvent composition. To locate the LCCC at various nanopore sizes, the temperature and solvent composition have been varied from 0 to 60 C and from 51 to 62 v/v% of methylene chloride, respectively.

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